Queensland Government

Requirements for the ongoing assessment of treatment system performance

Procedural guidelines for owners and masters of ships fitted with sewage treatment systems

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1 Overview

It is a legal requirement for the owner and master of a ship fitted with a sewage treatment system, to ensure that the treatment system is assessed and maintained at the required intervals. Section 55 of the *Transport Operations (Marine Pollution) Regulation 2008* states that the owner and master of a ship fitted with a treatment system must ensure that the treatment system:

a. is assessed by an **independent testing entity** to show that the levels of sewage quality characteristics remaining in the sewage after it has been treated in the treatment system are not more than the levels for the grade of treated sewage for the treatment system, at the following intervals after the treatment system is fitted to the ship:–

   i. for a **declared ship** (*i.e.* a commercially registered class 1B, 1C, 1D, 1E or 1F ship under the *Transport Operations (Marine Safety) Regulation 2004* that has a fixed toilet)—

      - at least annually for the first 2 years, and
      - afterwards, at least every 2 years,

   ii. for a ship other than a declared ship (or a '***non-declared ship***', *i.e.* all **recreational** ships and all commercially registered **class 2** and **class 3** ships under the *Transport Operations (Marine Safety) Regulation 2004*)—

      - at least once in the first 5 years, and
      - afterwards, at least every 2 years; and

b. is maintained, at least, at the intervals and in the way required by the treatment system service manual.

An ***independent testing entity*** is an entity that—

a. is accredited by the National Association of Testing Authorities (NATA) as competent to perform analyses of the levels of sewage quality characteristics remaining in sewage after it has been treated in a treatment system for Grade A treated sewage, Grade B treated sewage or Grade C treated sewage; and

b. performs the abovementioned analyses in Australia.

1.1 Stages of assessment

There are six (6) simple steps to follow when having a sewage treatment system assessed. These steps are summarised below with full explanations given in the following pages.

1. **Obtain copies of the relevant legislative requirements.**
2. **Identify, locate and contact an appropriate independent testing entity to discuss your needs.**
3. **Ensure the treatment system is being used and tested under <u>normal operating conditions</u>.**
4. **Collect, contain, store, deliver and submit samples and relevant documentation to your chosen independent testing entity.**
5. **Have samples analysed for the appropriate characteristics.**
6. **Depending upon the results of the assessment, either:–**
    a. **PASS—Place a copy of the assessment results in your system documentation.**

       OR

    b. **FAIL[1]—Contact the relevant system manufacturer/supplier to discuss further action.**

[1] **NOTE:** If a sewage treatment system fails an assessment the sewage ***<u>IS NOT</u>*** classed as '**treated sewage**' and must therefore be discharged in accordance with the '**nil discharge requirements**' for '**untreated sewage**'.
For '**declared ships**', this **MUST** be incorporated into, and clearly stated in, the '**shipboard sewage management plan**' of any '**declared ship**' that **DOES NOT** carry a **current** assessment report showing that the system has '**passed**' the necessary requirements.

2 Legislative requirements

Obtain copies of the relevant legislative requirements, that is the *Transport Operations (Marine Pollution) Act 1995* and *Regulation 2008*. Copies of the legislative requirements are freely available either from the Maritime Safety Queensland (MSQ) website at http://www.msq.qld.gov.au under the '**Legislation**' link or from the Office of the Queensland Parliamentary Counsel (OQPC) website at http://www.legislation.qld.gov.au under the '**Acts**, **SL as in force**' and then look under '**T**' for '**Transport**' (a link to the OQPC website can also be found on the abovementioned Maritime Safety Queensland '**Legislation**' webpage).

The following sections are those of most interest:–

1. ***Transport Operations (Marine Pollution) Act 1995*** **(TOMPA)**
   a. Section 51 **Shipboard sewage management plan** (declared ships only)
   b. Section 51B **Treatment system to be in proper working order** (all ships)
2. ***Transport Operations (Marine Pollution) Regulation 2008*** **(TOMPR)**
   a. Section 49 **Minimum requirements for shipboard sewage management plan** (declared ships only)
   b. Division 6 **Treatment systems and documents about treatment systems**
   c. Section 54 **Definitions for div 6**
   d. Section 55 **Maintenance and assessment of treatment system for ships**
   e. Section 56 **Documents to be kept onboard ship fitted with treatment system**
   f. Section 58 **Standard with which a treatment system must conform**
   g. Schedule 7 **Levels of sewage quality characteristics for treated sewage** (Sections 55 and 57)
      i Part 1—**Interpretation**
      ii Part 2—**Levels for Grade A treated sewage**
      iii Part 3—**Levels for Grade B treated sewage**
      iv Part 4—**Levels for Grade C treated sewage**
   h. Schedule 9 **Dictionary** (Section 3)

3 Testing facility requirements

An assessment of a treatment system must be carried out by an **independent testing entity** (see Section 55 of the TOMPR). An **independent testing entity** is an entity that is:

(a). accredited by **NATA** (*i.e.* the National Association of Testing Authorities, ABN 59 004 379 748) as competent to perform analyses of the levels of sewage quality characteristics remaining in sewage after it has been treated in a sewage treatment system for Grade A treated sewage, Grade B treated sewage or Grade C treated sewage; and

(b). performs the above-mentioned analyses **in Australia.**

(see Section 54 of the TOMPR).

Therefore, you will need to do the following:

1. **Locate**, and make contact with, a suitably accredited independent testing entity;
2. **Explain** your requirements, that is, you need to have a sample of sewage from a sewage treatment system tested/analysed for compliance with the requirements of Queensland's *Transport Operations (Marine Pollution) Regulation 2008*, for the relevant characteristics (specific to the grade of treated sewage being assessed) as follows:–
   a. Grade A Treated Sewage—
      i **Thermotolerant coliforms**,
      ii **Total suspended solids**, and
      iii **Biochemical oxygen demand**.
   b. Grade B Treated Sewage—
      i **Thermotolerant coliforms**, and
      ii **Total suspended solids**.
   c. Grade C Treated Sewage—
      i **Thermotolerant coliforms**.
      and
3. Develop an appropriate sampling regime (see '6 Testing/analysis requirements' for further detail).

To locate a suitably accredited NATA testing facility, simply log on to the NATA website (http://www.nata.asn.au) and, using it's '**Find a Facility or Lab**' feature (see Figure 1), enter the relevant information, as follows:

1. **Thermotolerant coliforms**:–
   a. Enter **thermotolerant coliforms** in '**Keywords**',
   b. Choose '**Biological Testing**' in the testing field option,
   c. Choose '**QLD**' in the state field option, and
   d. Click on the '**Search**' button.
2. **Total suspended solids**:–
   a. Enter **suspended solids** in '**Keywords**',
   b. Choose '**Chemical Testing**' in the testing field option,
   c. Choose '**QLD**' in the state field option, and
   d. Click on the '**Search**' button.
3. **Biochemical oxygen demand**:–
   a. Enter **biochemical oxygen demand** in '**Keywords**',
   b. Choose '**Chemical Testing**' in the testing field option,
   c. Choose '**QLD**' in the state field option, and
   d. Click on the '**Search**' button.

Figure 1 provides an illustration of how to enter a query in the 'Find a Facility or Lab' feature on the NATA website. Additional instructions that may provide assistance to your search can also be obtained by using the '**Search Tips**' feature.

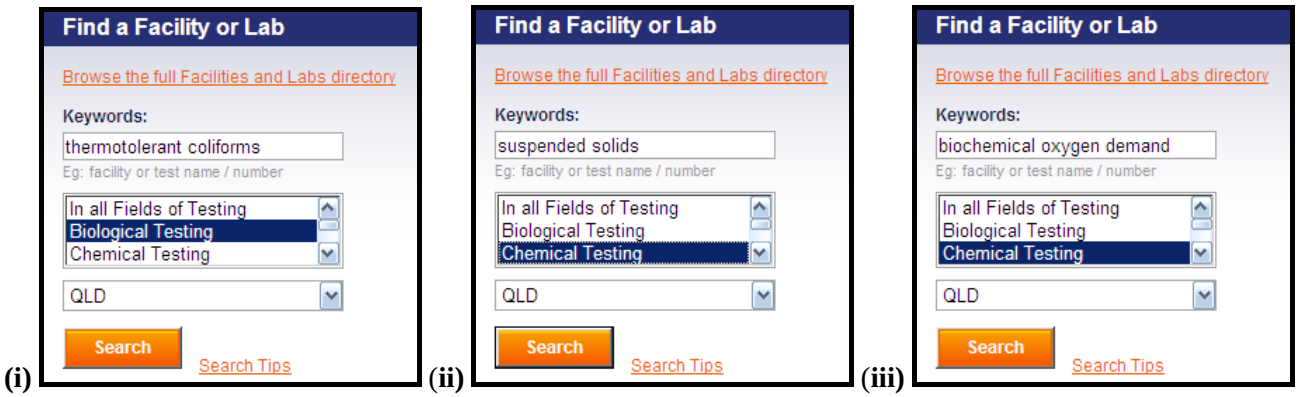

Figure 1: Examples of how to enter a query in the 'Find a Facility or Lab' feature on the NATA website for facilities within Queensland that are accredited by NATA to perform analyses on (i) thermotolerant coliforms, (ii) suspended solids and (iii) biochemical oxygen demand.

You can also use the '**Contact Directory**' feature (at the bottom of the NATA homepage) to obtain the telephone, fax and email contact details of various NATA personnel that will be able to assist you with your enquiries (see Figure 2 below for an illustration of this feature). Alternatively, you can obtain similar contact information from telephone directories such as the Australian Yellow and White Pages®, by searching under '**NATA**'.

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Sydney (Head Office) PO Box 7507, Silverwater, NSW, 2128

Figure 2: The 'Contact Directory' feature on the NATA website.

4 Normal operating condition requirements

An assessment of the levels of sewage quality characteristics remaining in sewage after it has been treated in a treatment system must be carried out **under normal operating conditions** (see Division 6 of the TOMPR). Therefore, the system being assessed must be installed onboard a vessel and used in the appropriate manner as intended by the manufacturer, that is, receiving sewage comprised of the day-to-day faecal matter, toilet paper and urine produced onboard during normal operational use with regard to the rated number of persons and/or volume of sewage that the system was designed to effectively treat. The use of laboratory prepared sewage as a test medium is **NOT** acceptable for use in the assessment of onboard sewage treatment systems. Some guidance on the composition of human sewage is given in Attachment 8 (see page 27).

Information outlining an individual treatment system's specific operational parameters (that is, it's ***normal operating conditions***) should be included with the system documentation (documentation that must legally be supplied by the system manufacturer/supplier with each and every system sold for use in Queensland waters). If you are unsure of the normal operating conditions for the specific treatment system installed on your vessel, you should contact the system manufacturer/supplier that supplied/installed the system to obtain such information.

Fleet owners/operators should be aware that it is a legal requirement that **each** individual treatment system on **each** individual vessel in the **entire fleet** must:

a. be assessed at the appropriate intervals (as outlined in the legislation); and

b. have a suitable assessment report issued from the relevant independent testing entity (see examples of assessment reports on pages 22, 24 and 26).

Owners/operators must ensure that the assessment report is included with the original system documentation (that was supplied by the system manufacturer/supplier) and kept onboard the vessel at all times (see sections 55 and 56 of the TOMPR).

5 Sample collection requirements

NOTE: Sewage contains material that may pose a human health risk and should always be handled with care. Ensure that all samples are collected as directed by the relevant independent testing entity.

It is not a legislative requirement for samples to be ***collected*** by an independent testing entity. However, it should be clearly understood that samples **must** be collected, treated, stored and transported in the appropriate manner ***as directed by the relevant independent testing entity***. Therefore, following appropriate instruction from the relevant independent testing entity, samples may be collected in the prescribed manner by any of the following:

a. an independent testing entity;

b. a vessel owner/operator; or

c. an interested third party (such as a system manufacturer or one of their authorised service providers).

Samples of treated sewage **must** be collected from a point **within** the vessel that is inline with, and after, the treatment system but before the treated sewage is discharged into a waterway and **NOT** from within the water column following discharge.

Note: Treatment systems should be installed in a manner that allows for the collection of samples for testing, *i.e.* have some form of tap, gate-valve, Y-valve or similar **practically accessible** collection point in the discharge line between the sewage treatment system (**after** the treatment process has been completed) and **before** the overboard discharge point.

Owners/operators having a **Grade A** or **Grade B** sewage treatment system assessed should be aware that Part of the assessment includes the analysis of **total suspended solids**, which requires a comparison with the ambient water used for flushing purposes (see '**suspended solids**' requirements in Schedule 7 Parts 2 and 3 of the TOMPR). Therefore, a sample of the flush water (*i.e.* a **blank**) **must** also be collected and presented to the independent testing entity for analysis at the same time as the sample of treated sewage is collected and presented to the independent testing entity for analysis.

Generally, the water used for flushing purposes will be the surrounding waters that the vessel is floating in/on at the time the sample of treated sewage is collected. Cases where this scenario is unlikely are vessels that use freshwater flush toilets and carry additional freshwater onboard for this purpose. In this situation, the **blank** water sample should be collected from the onboard freshwater tank that is connected to the toilet/sewage treatment system.

The following provides an overview of the general sample collection, treatment, storage and transport process. The specific requirements for the overall procedure **must** be determined during direct prior consultation with the relevant independent testing entity that has been chosen to perform the required analyses. An overall summary of sample collection, treatment and transportation requirements is provided in Attachment 1 (see page 20) as a general guide.

1. Collect samples in the appropriate manner as directed by the relevant independent testing entity (making sure to clearly note and record the time and date that the samples were taken);

2. Place samples in the appropriate sample containers as directed by the relevant independent testing entity;

3. Store samples in the appropriate manner as directed by the relevant independent testing entity;

4. Transport and deliver samples to the relevant laboratory within the appropriate time-frame and in the appropriate manner as directed by the relevant independent testing entity; and

5. Submit samples along with relevant sections of the legislation and an example of an assessment report (see Attachment 3, Attachment 5 and Attachment 7 on pages 22, 24 and 26, respectively) to the relevant independent testing entity.

6 Testing/analysis requirements

When performing an **assessment** of a sewage treatment system, the **result of the analysis of a single sample** is sufficient. The requirements for sample analysis are divided into two parts:

1. **Part A: Mandatory Levels**; and
2. **Part B: Indicative Levels**.

The results of the analysis should satisfy both parts (*i.e.* **A** and **B**) to successfully meet the requirements of a valid treatment system assessment. The mandatory levels (Part A) are the values stated in legislation that **MUST** be strictly adhered to, to minimise potential impacts on human health and/or the environment. The indicative levels (Part B) are the values stated in this guideline document that **SHOULD** be adhered to, to give an indication of the quality of the sample being presented for analysis.

The indicative levels (Part B) will provide a greater level of confidence in both the authenticity of the results of the analysis from Part A and the procedures followed throughout the assessment process, and hence, ensure that suitable samples are presented for analysis with respect to:

a. the normal operating conditions requirement; and
b. the sample collection, treatment, storage and transport requirements of the relevant independent testing entity.

Note: An independent testing entity **MUST** be accredited by NATA to perform the analyses stated in '**Part A: Mandatory Levels**' of this guideline document. However, an independent testing entity is not required to be accredited by NATA to perform the analyses stated in '**Part B: Indicative Levels**' of this guideline document.

6.1 Part A: mandatory levels

(NATA accreditation **IS** required for these analyses)

The following sewage quality characteristics are those listed in Schedule 7 of the TOMPR and **MUST** be analysed for each of the relevant grades of treated sewage. The levels outlined below are a summary of the treated sewage requirements stated in the legislation, therefore, please ensure that you:

a. **obtain a complete copy** of the relevant legislative requirements for treated sewage (*i.e.* Schedule 7 of the TOMPR, Part 2 for Grade A Treated Sewage, Part 3 for Grade B Treated Sewage or Part 4 for Grade C Treated Sewage); and

b. **ensure that these are made available** to the relevant independent testing entity.

6.1.1 Grade A treated sewage

- Thermotolerant Coliforms (must not exceed 250 thermotolerant coliforms/100 mL)
- Suspended Solids (must not exceed 50 mg/L)*
- Biochemical Oxygen Demand (must not exceed 50 mg/L)

*__Note__: The suspended solids content of Grade A Treated Sewage must not be more than 50 mg/L above the suspended solids content of the ambient water used for flushing purposes, *i.e.* the blank.

6.1.2 Grade B treated sewage

- Thermotolerant Coliforms (must not exceed 150 thermotolerant coliforms/100 mL)
- Suspended Solids (must not exceed 50 mg/L)*

*__Note__: The suspended solids content of Grade B Treated Sewage must not be more than 50 mg/L above the suspended solids content of the ambient water used for flushing purposes, *i.e.* the blank.

6.1.3 Grade C treated sewage

- Thermotolerant Coliforms (must not exceed 150 thermotolerant coliforms/100 mL)

6.2 Part B: indicative levels

(NATA accreditation **NOT** required for these analyses)

In addition to the specific sewage quality characteristics mentioned in '**Part A**', **ALL** grades of treated sewage **SHOULD** also be analysed for **residual chlorine**, **total nitrogen**, **total phosphorous** and **pH**.

Note: Failure to analyse samples of treated sewage for these additional characteristics may void the results and require the system to be submitted for re-assessment.

It should be noted that these values are based on current commercially available treatment system technology and are provided as guidance of sample quality. They should not be taken as an indication of future government policy on chlorine or nutrient levels for treated sewage. Understandably, these levels may vary as new technology becomes available and this factor should be taken into consideration when interpreting results.

Analyses of these values will also indicate if chlorine is being discharged into the environment at a level which may potentially generate greater environmental harm than the treated sewage itself.

Note: Analysis of residual chlorine need not be performed for treatment systems that do not use/generate chlorine, in such cases simply insert '**N/A**' in the relevant place on the assessment report.

6.2.1 Grade A treated sewage

- Residual Chlorine*—
  - within 5 minutes of sampling (should not exceed 10 mg/L)
  - within 24 hours of sampling (should not exceed 5 mg/L)
- Total Nitrogen (should be in the range of 20–150 mg/L)
- Total Phosphorous (should be in the range of 9–40 mg/L)
- pH (should be in the range of 6.0–8.5)

***Note:** Treatment systems that DO NOT use/generate chlorine DO NOT require the analysis of residual chlorine to be performed, in such cases simply insert "N/A" in the appropriate place on the assessment report.

Treatment systems that DO use/generate chlorine DO require the analysis of residual chlorine to be performed, in such cases please ensure that the relative time that the analysis was performed is clearly indicated on the assessment report, *i.e.* '**within 5 minutes of sampling**' or '**within 24 hours of sampling**' (for further information see note on chlorine analysis in '*Attachment 1: Summary of requirements for the collection and submission of samples to laboratories*' on page 20).

6.2.2 Grade B treated sewage

- Residual Chlorine*—
  - within 5 minutes of sampling (should not exceed 10 mg/L)
  - within 24 hours of sampling (should not exceed 5 mg/L)
- Total Nitrogen (should be in the range of 210–940 mg/L)
- Total Phosphorous (should be in the range of 16–90 mg/L)
- pH (should be in the range of 6.0–8.5)

***Note:** Treatment systems that DO NOT use/generate chlorine DO NOT require the analysis of residual chlorine to be performed, in such cases simply insert "N/A" in the appropriate place on the assessment report.

Treatment systems that DO use/generate chlorine DO require the analysis of residual chlorine to be performed, in such cases please ensure that the relative time that the analysis was performed is clearly indicated on the assessment report, *i.e.* '**within 5 minutes of sampling**' or '**within 24 hours of sampling**' (for further information see note on chlorine analysis in '*Attachment 1: Summary of requirements for the collection and submission of samples to laboratories*' on page 20).

6.2.3 Grade C treated sewage

- Residual Chlorine*—
  - within 5 minutes of sampling (should not exceed 10 mg/L)
  - within 24 hours of sampling (should not exceed 5 mg/L)
- Total Nitrogen (should be in the range of 400–1,700 mg/L)
- Total Phosphorous (should be in the range of 25–130 mg/L)
- pH (should be in the range of 6.0–8.5)

***Note:** Treatment systems that DO NOT use/generate chlorine DO NOT require the analysis of residual chlorine to be performed, in such cases simply insert "N/A" in the appropriate place on the assessment report.

Treatment systems that DO use/generate chlorine DO require the analysis of residual chlorine to be performed, in such cases please ensure that the relative time that the analysis was performed is clearly indicated on the assessment report, *i.e.* '**within 5 minutes of sampling**' or '**within 24 hours of sampling**' (for further information see note on chlorine analysis in '*Attachment 1: Summary of requirements for the collection and submission of samples to laboratories*' on page 20).

7 Assessment result requirements

There are two possible outcomes resulting from a performance assessment of a sewage treatment system:

1. The system can **PASS** the assessment
   (*i.e.* the results of the analyses meet **ALL** the requirements outlined in step **6 Testing/analysis requirements**);

   OR

2. The system can **FAIL** the assessment
   (*i.e.* the results of the analyses **DO NOT** meet **ALL** the requirements outlined in step **6 Testing/analysis requirements**).

The appropriate course of action following an assessment of a sewage treatment system's performance, is as follows:

1. If the system **PASSES** the assessment, a copy of the assessment report must be placed within the system documentation and kept onboard the vessel;

   OR

2. If the system **FAILS** the assessment, contact the relevant system manufacturer/supplier and discuss further action, then:–

   a. Take the necessary remedial action to ensure that the system is operating as the manufacturer intended, to meet the legislative discharge requirements; and

   b. Submit the system for re-assessment, *i.e.* repeat steps **3–6** of the '**Stages of assessment**' on page 5.[2]

NOTE: Sewage from a treatment system that fails an assessment **IS NOT** classed as '**treated sewage**' and must therefore be discharged in accordance with the '**nil discharge requirements**' for '**untreated sewage**'.
For '**declared ships**, this **MUST** be incorporated into, and clearly stated in, the '**shipboard sewage management plan**' of any '**declared ship**' that **DOES NOT** carry a **current** assessment report showing that the system has **passed** the necessary requirements.

[2] **NOTE:** It is a legal requirement for the owner or master of a ship fitted with a sewage treatment system to (a) keep records of an assessment of a treatment system's performance that includes the name of the independent testing entity that conducted the assessment and the date and results of the assessment (see examples in Attachment 3, Attachment 5 and Attachment 7 on pages 22, 24 and 26, respectively), and (b) ensure that such records are kept onboard the ship (see section 56 of the TOMPR).

Attachments

Attachment 1:
Summary table of requirements for the collection and submission of samples to laboratories

Attachment 2:
Summary of analyses required for a Grade A sewage treatment system

Attachment 3:
Example of an assessment report for a Grade A sewage treatment system

Attachment 4:
Summary of analyses required for a Grade B sewage treatment system

Attachment 5:
Example of an assessment report for a Grade B sewage treatment system

Attachment 6:
Summary of analyses required for a Grade C sewage treatment system

Attachment 7:
Example of an assessment report for a Grade C sewage treatment system

Attachment 8:
Explanatory information on the composition of human sewage

Explanatory information for attachments:

- Summaries of Analyses Required for Grade A, Grade B and Grade C Sewage Treatment Systems (***i.e.*** Attachment 2, Attachment 4 and Attachment 6, respectively); and
- Examples of Assessment Reports for Grade A, Grade B or Grade C Sewage Treatment System (***i.e.*** Attachment 3, Attachment 5 and Attachment 7, respectively).

The owner or master of a ship fitted with a sewage treatment system must keep written records for the treatment system and ensure that they are kept onboard the ship (see Section 56 of the TOMPR). For an assessment of a treatment system's performance these records **MUST** include the following particulars:–

a. the name of the independent testing entity that conducted the assessment; and

b. the date and results of the assessment.

(see Section 56 of the TOMPR)

The following attachments provide (i) an overall outline of the analyses required for each of the various grades of treated sewage, and (ii) examples of the minimum requirements for an assessment report that should be provided by an independent testing entity following an assessment of a sewage treatment system's performance. As this report forms Part of the legal record keeping requirements, it would be **greatly appreciated** if independent testing entities could adhere to the style/format of these templates (to the maximum extent possible). This will ensure a high level of consistency in the official documentation which will help ease interpretation and understanding of assessment results by ship owners and operators, compliance officers, other independent testing entities and potential purchasers of ships fitted with treatment systems. Templates for these reports are available from the Maritime Safety Queensland (MSQ) website at http://www.msq.qld.gov.au under '**Environment**', '**Ship-sourced sewage management**' link.

The mandatory levels listed in each of the following attachments (*i.e.* Attachment 2, Attachment 4 and Attachment 6) are a summary of the requirements for the various grades of treated sewage, please ensure that you:– (a) obtain a complete copy of the relevant legislative requirements for treated sewage (*i.e.* Schedule 7 of the TOMPR, Part 2 for Grade A Treated Sewage, Part 3 for Grade B Treated Sewage or Part 4 for Grade C Treated Sewage), and (b) ensure that these are made available to the relevant independent testing entity.

Please remember that an independent testing entity **MUST** be accredited by NATA to perform the analyses of the '**Mandatory Levels**' stated in Attachment 2, Attachment 4 and Attachment 6 of this guideline document. However, an independent testing entity is **not required** to be accredited by NATA to perform the analyses of the '**Indicative Levels**' stated in Attachment 2, Attachment 4 and Attachment 6 of this guideline document.

Attachment 1: Summary of requirements for the collection and submission of samples to laboratories. These procedures are based on ISO 5667-3: 2003–Water Quality–Sampling–Part 3: Guidance on the preservation and handling of water samples

Sewage Quality Characteristic	Container Type (see note below)*	Filling Technique	Preservation	Maximum Holding Time	Comments
Biochemical Oxygen Demand (5 days)	2000 mL HDPE Detergent Washed	Do not pre-rinse container. Fill container completely to exclude air	Refrigerate and store in the dark	24 hours	Samples must be received at the laboratory within 24 hours of sampling. Prior contact with the laboratory conducting the analysis is required to check appropriate sample submission times/days.
pH	Sample analysed from above 2000 mL container.	As above.	As above.	6 hours	Test should be carried out as soon as possible, preferably in the field.
Total Suspended Solids	Sample analysed from above 2000 mL container.	As above.	As above.	24 hours	—
Total Suspended Solids–Blank **NOTE:** This blank is **only** required for Grade A and Grade B treated sewage.	1000 mL HDPE Detergent Washed	Fill container completely to exclude air	Refrigerate	24 hours	Samples must be received at the laboratory within 24 hours of sampling. Prior contact with the laboratory conducting the analysis is required to check appropriate sample submission times/days.
Total Nitrogen & Total Phosphorous	250 mL HDPE Reverse Osmosis Water Washed	Fill container to 90% full only, to allow for expansion on freezing	Freeze	1 month	—
Free Chlorine & Total Chlorine	250 mL HDPE Detergent Washed	Fill container completely	Store in dark	5 minutes	The analysis should be carried out in the field within 5 minutes of sample collection. **Note:** If this is ***not*** possible, refrigerate samples. However, laboratory analysis of submitted samples will only produce indicative values.
Thermotolerant (Faecal) Coliforms	250 mL Polystyrene Sterile	Do not pre-rinse container. Do not touch inside of container or lid during sampling	Container should contain 25 mg sodium thiosulphate to neutralise chlorine.	24 hours	Samples must be received at the laboratory within 24 hours of sampling. Prior contact with the laboratory conducting the analysis is required to check appropriate sample submission times/days.

***Note:** Quality Assured Containers should be sourced from the laboratory conducting the analysis.

Attachment 2: Summary of analyses required for a Grade A sewage treatment system

The mandatory levels listed below are a summary of the requirements for Grade A treated sewage stated in the legislation, please ensure that you:– (a) obtain a complete copy of the relevant legislative requirements for Grade A treated sewage (*i.e.* Schedule 7, Part 2 of the TOMPR), and (b) ensure that these are made available to the relevant independent testing entity.

Grade A: Mandatory Levels (NATA accreditation required)

- Thermotolerant Coliforms (must not exceed 250 thermotolerant coliforms/100 mL)
- Suspended Solids (must not exceed 50 mg/L)*
- Biochemical Oxygen Demand (must not exceed 50 mg/L)

*__Note__: The suspended solids content of Grade A Treated Sewage must not be more than 50 mg/L above the suspended solids content of the ambient water used for flushing purposes, *i.e.* the blank.

Grade A: Indicative Levels (NATA accreditation not required)

- Residual Chlorine*—
  - within 5 minutes of sampling (should not exceed 10 mg/L)
  - within 24 hours of sampling (should not exceed 5 mg/L)
- Total Nitrogen (should be in the range of 20–150 mg/L)
- Total Phosphorous (should be in the range of 9–40 mg/L)
- pH (should be in the range of 6.0–8.5)

***Note:** Treatment systems that DO NOT use/generate chlorine DO NOT require the analysis of residual chlorine to be performed, in such cases simply insert "N/A" in the appropriate place on the assessment report.

Treatment systems that DO use/generate chlorine DO require the analysis of residual chlorine to be performed, in such cases please ensure that the relative time that the analysis was performed is clearly indicated on the assessment report, *i.e.* '**within 5 minutes of sampling**' or '**within 24 hours of sampling**' (for further information see note on chlorine analysis in '*Attachment 1: Summary of requirements for the collection and submission of samples to laboratories*' on page 20).

Attachment 3: Example of an assessment report to be provided by an independent testing entity following an ongoing assessment of a Grade A sewage treatment system's performance

(NOTE: This report to have official NATA insignia/logo attached)

(*insert name of independent testing entity and the contact details of the relevant laboratory representative in the spaces below*)

Enquiries to:
Telephone:
Facsimile:
Email:
Our Ref:

WATER ANALYSIS REPORT

To: (*insert name of manufacturer/distributor requesting analysis here*)
(*insert company name of manufacturer/distributor requesting analysis – if applicable – here*)
(*insert address of manufacturer/distributor requesting analysis*)

Results of Analysis of Treated Sewage from Grade A "*INSERT SEWAGE TREATMENT SYSTEM NAME HERE*" Sewage Treatment System

Your Reference and Date Received	Our Reference	Thermotolerant Coliforms[i] (MPN/100mL)	Total Suspended Solids[i] (mg/L)	Biochemical Oxygen Demand[i] (mg/L)	Residual Chlorine[ii] (mg/L)	Total Nitrogen (mg/L)	Total Phosphorous (mg/L)	pH
Method Reference		*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*
1a. 090218 Grade A–08:30								
1b. 090218 BLANK–08:30		—		—	—	—	—	—
Grade A treated sewage must not exceed the following values:		**250 MPN/100mL**	**50[iii] mg/L**	**50 mg/L**	[iv]	[iv]	[iv]	[iv]

Notes:
[i] Independent Testing Entity must have NATA accreditation for these analyses.
[ii] Please indicate when residual chlorine samples were analysed (*i.e.* 'within 5 minutes of sampling' or 'within 24 hours of sampling').
[iii] Total suspended solids must not be more than 50mg/L above the suspended solids content of the ambient water used for flushing.
[iv] Refer to **Step 6: Testing/Analysis Requirements–Part B Indicative Levels** of the guidelines for the "*Requirements for the Ongoing Assessment of Treatment System Performance*" for these ***indicative*** values.
— indicates blank analysis not required for this sewage quality characteristic (*i.e.* blank analysis required for total suspended solids only).

EST = Estimated Count
MPN = Most Probable Number

(*insert name of the relevant independent testing entity laboratory representative here*)
NATA Signatory
(*insert relevant departmental details for laboratory representative*)

Date: .....

Office *(insert office address details for independent testing entity here)*
Postal *(insert postal address details for independent testing entity here)*
Telephone Main Enquiries Number: *(insert main telephone contact details for independent testing entity here)*
Facsimile Main Office Number: *(insert main facsimile contact details for independent testing entity here)*

NATA Accredited Laboratory Number (*insert 'Accredited Laboratory Number' for independent testing entity here*). These results relate to the sample as collected.
This document may not be reproduced except in full, without the written approval of (*insert name of independent testing entity here*).

.....

(report template available from http://www.msq.qld.gov.au under 'Environment', 'Ship-sourced sewage management' link)

Attachment 4: Summary of analyses required for a Grade B sewage treatment system

The mandatory levels listed below are a summary of the requirements for Grade B treated sewage stated in the legislation, please ensure that you:– (a) obtain a complete copy of the relevant legislative requirements for Grade B treated sewage (*i.e.* Schedule 7, Part 3 of the TOMPR), and (b) ensure that these are made available to the relevant independent testing entity.

Grade B: Mandatory Levels (NATA accreditation required)

- Thermotolerant Coliforms (must not exceed 150 thermotolerant coliforms/100 mL)
- Suspended Solids (must not exceed 50 mg/L)*

***Note**: The suspended solids content of Grade B Treated Sewage must not be more than 50 mg/L above the suspended solids content of the ambient water used for flushing purposes, *i.e.* the blank.

Grade B: Indicative Levels (NATA accreditation not required)

- Residual Chlorine*—
  - within 5 minutes of sampling (should not exceed 10 mg/L)
  - within 24 hours of sampling (should not exceed 5 mg/L)
- Total Nitrogen (should be in the range of 210–940 mg/L)
- Total Phosphorous (should be in the range of 16–90 mg/L)
- pH (should be in the range of 6.0–8.5)

***Note:** Treatment systems that DO NOT use/generate chlorine DO NOT require the analysis of residual chlorine to be performed, in such cases simply insert "N/A" in the appropriate place on the assessment report.

Treatment systems that DO use/generate chlorine DO require the analysis of residual chlorine to be performed, in such cases please ensure that the relative time that the analysis was performed is clearly indicated on the assessment report, *i.e.* '**within 5 minutes of sampling**' or '**within 24 hours of sampling**' (for further information see note on chlorine analysis in '*Attachment 1: Summary of requirements for the collection and submission of samples to laboratories*' on page 20).

Attachment 5: Example of an assessment report to be provided by an independent testing entity following an ongoing assessment of a Grade B sewage treatment system's performance

(NOTE: This report to have official NATA insignia/logo attached)

(*insert name of independent testing entity and the contact details of the relevant laboratory representative in the spaces below*)

Enquiries to:
Telephone:
Facsimile:
Email:
Our Ref:

WATER ANALYSIS REPORT

To: (*insert name of manufacturer/distributor requesting analysis here*)
(*insert company name of manufacturer/distributor requesting analysis – if applicable – here*)
(*insert address of manufacturer/distributor requesting analysis*)

Results of Analysis of Treated Sewage from Grade B "*INSERT SEWAGE TREATMENT SYSTEM NAME HERE*" Sewage Treatment System

Your Reference and Date Received	Our Reference	Thermotolerant Coliforms[i] (MPN/100mL)	Total Suspended Solids[i] (mg/L)	Residual Chlorine[ii] (mg/L)	Total Nitrogen (mg/L)	Total Phosphorous (mg/L)	pH
Method Reference		*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*
1a. 090218 Grade B–08:30							
1b. 090218 BLANK–08:30		—		—	—	—	—
Grade B treated sewage must not exceed the following values:		**150 MPN/100mL**	**50[iii] mg/L**	iv	iv	iv	iv

Notes:
[i] Independent Testing Entity must have NATA accreditation for these analyses.
[ii] Please indicate when residual chlorine samples were analysed (*i.e.* 'within 5 minutes of sampling' or 'within 24 hours of sampling').
[iii] Total suspended solids must not be more than 50mg/L above the suspended solids content of the ambient water used for flushing.
[iv] Refer to **Step 6: Testing/Analysis Requirements–Part B Indicative Levels** of the guidelines for the "*Requirements for the Ongoing Assessment of Treatment System Performance*" for these ***indicative*** values.
—— indicates blank analysis not required for this sewage quality characteristic (*i.e.* blank analysis required for total suspended solids only).

EST = Estimated Count
MPN = Most Probable Number

(*insert name of the relevant independent testing entity laboratory representative here*) **Date: .....**
NATA Signatory
(*insert relevant departmental details for laboratory representative*)

Office *(insert office address details for independent testing entity here)*
Postal *(insert postal address details for independent testing entity here)*
Telephone Main Enquiries Number: *(insert main telephone contact details for independent testing entity here)*
Facsimile Main Office Number: *(insert main facsimile contact details for independent testing entity here)*

NATA Accredited Laboratory Number (*insert 'Accredited Laboratory Number' for independent testing entity here*). These results relate to the sample as collected.
This document may not be reproduced except in full, without the written approval of (*insert name of independent testing entity here*).

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(report template available from http://www.msq.qld.gov.au under 'Environment', 'Ship-sourced sewage management' link)

Attachment 6: Summary of analyses required for a Grade C sewage treatment system

The mandatory levels listed below are a summary of the requirements for Grade C treated sewage stated in the legislation, please ensure that you:– (a) obtain a complete copy of the relevant legislative requirements for Grade C treated sewage (*i.e.* Schedule 7, Part 4 of the TOMPR), and (b) ensure that these are made available to the relevant independent testing entity.

Grade C: Mandatory Levels (NATA accreditation required)

- Thermotolerant Coliforms (must not exceed 150 thermotolerant coliforms/100 mL)

Grade C: Indicative Levels (NATA accreditation not required)

- Residual Chlorine*—
  - within 5 minutes of sampling (should not exceed 10 mg/L)
  - within 24 hours of sampling (should not exceed 5 mg/L)
- Total Nitrogen (should be in the range of 400–1,700 mg/L)
- Total Phosphorous (should be in the range of 25–130 mg/L)
- pH (should be in the range of 6.0–8.5)

***Note:** Treatment systems that DO NOT use/generate chlorine DO NOT require the analysis of residual chlorine to be performed, in such cases simply insert "N/A" in the appropriate place on the assessment report.

Treatment systems that DO use/generate chlorine DO require the analysis of residual chlorine to be performed, in such cases please ensure that the relative time that the analysis was performed is clearly indicated on the assessment report, *i.e.* '**within 5 minutes of sampling**' or '**within 24 hours of sampling**' (for further information see note on chlorine analysis in '*Attachment 1: Summary of requirements for the collection and submission of samples to laboratories*' on page 20).

Attachment 7: Example of an assessment report to be provided by an independent testing entity following an ongoing assessment of a Grade C sewage treatment system's performance

(**NOTE: This report to have official NATA insignia/logo attached**)

(*insert name of independent testing entity and the contact details of the relevant laboratory representative in the spaces below*)

Enquiries to:
Telephone:
Facsimile:
Email:
Our Ref:

WATER ANALYSIS REPORT

To: (*insert name of manufacturer/distributor requesting analysis here*)
(*insert company name of manufacturer/distributor requesting analysis – if applicable – here*)
(*insert address of manufacturer/distributor requesting analysis*)

Results of Analysis of Treated Sewage from Grade C "*INSERT SEWAGE TREATMENT SYSTEM NAME HERE*" Sewage Treatment System

Your Reference and Date Received	Our Reference	Thermotolerant Coliforms[i] (MPN/100mL)	Residual Chlorine[ii] (mg/L)	Total Nitrogen (mg/L)	Total Phosphorous (mg/L)	pH
Method Reference		*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*	*(insert method ref. no. here)*
1a. 090218 Grade C–08:30						
Grade C treated sewage must not exceed the following values:		**150 MPN/100mL**	[iii]	[iii]	[iii]	[iii]

Notes:
[i] Independent Testing Entity must have NATA accreditation for these analyses.
[ii] Please indicate when residual chlorine samples were analysed (*i.e.* 'within 5 minutes of sampling' or 'within 24 hours of sampling').
[iii] Refer to **Step 6: Testing/Analysis Requirements–Part B Indicative Levels** of the guidelines for the "*Requirements for the Ongoing Assessment of Treatment System Performance*" for these ***indicative*** values.

EST = Estimated Count
MPN = Most Probable Number

(*insert name of the relevant independent testing entity laboratory representative here*)
NATA Signatory
(*insert relevant departmental details for laboratory representative*)

Date: .....

NATA Accredited Laboratory Number *(insert 'Accredited Laboratory Number' for independent testing entity here).* These results relate to the sample as collected.
This document may not be reproduced except in full, without the written approval of *(insert name of independent testing entity here).*

(report template available from http://www.msq.qld.gov.au under 'Environment', 'Ship-sourced sewage management' link)

Attachment 8: Explanatory information on the composition of human sewage

The following may provide some useful information on the typical composition of human sewage.

Liquid:Solid Ratio of Human Toilet Practices

The average liquid to solid ratio of trips to the toilet is generally in the vicinity of 4:1 (meaning, that an average person generally urinates approximately 4 times per every 1 defecation, with allowance made for a minimum of at least one defecation per person per day).

(see *US Coast Guard CFR Title 33 Navigation and Navigable Waters—Part 159: Marine Sanitation Devices—Section 121: Sewage Processing Test*)

Composition of Human Faeces and Urine

Quantity (wet) per person per day

Faeces = 100–400 g (average approximately 250 g)

Urine = 1.0–1.31 kg or approximately 1.0–1.31 L (average approximately 1.15 kg or 1.15 L)

(see *Gabriel Britton (1999) Wastewater Microbiology 2nd Edition*)